

AMENDMENTS TO THE DRAWINGS

The attached 2 replacement sheets of drawings, including Figures 1-3, replace the previously submitted 2 sheets of drawings including Figures 1-3. More specifically, Applicants have amended Figures 2 and 3. Each replacement sheet has been clearly labeled "Replacement Sheet" in the page header.

Attachment: 2 Replacement Sheets of drawings including Figures 1-3

REMARKS

Claims 4-13 and 15-18 remain in the application. Claims 1-3 and 14 have been cancelled. New claims 15-18 has been added. Claims 4, 6, 10, 12 and 13 have been amended. Claims 13 and 15 are in independent form.

The specification has been amended to clarify terminology set forth originally in the application as filed. More specifically, Applicants have amended the specification at paragraph [0014] to recite the balance shaft 24 as "including at least two axially spaced offset masses 25, 27." The support for this amendment to the specification is found in the originally filed drawings.

1-2. The Examiner has objected to the drawings under 37 C.F.R. § 1.83(a) as not showing every feature of the invention specified in the claims. Specifically, the Examiner states that the drawings do not show that the "oil pump housing includes a third bore for supporting the sprocket end of the drive shaft" as set forth in claim 10 of the above-captioned application.

In response, Applicants have amended claim 10 by deleting "oil pump housing" and inserting "sprocket side" in its place to read "the sprocket side includes a third bore for supporting a sprocket end of the drive shaft." Figure 3 of the drawings in the above-captioned application shows a sprocket side (32) including a third bore (52) for supporting a sprocket end (14) of the drive shaft (12). As a result, Applicants respectfully request that the objection to the drawings under 37 C.F.R. § 1.83(a) be withdrawn.

The Examiner has also noted that Figure 2 should be designated by a legend such as "Prior Art" because only that which is old is illustrated. In response, Applicants have amended Figure 2 by inserting the legend "Prior Art."

In addition, Applicants have amended Figure 3 by deleting the previously existing reference character 60 and inserting new reference character 60 to correctly identify a fourth bore for supporting a pump end of the drive shaft. Further, Applicants have amended Figure 3 by inserting reference numerals 25, 27 to identify the at least two axially spaced offset masses.

The above-mentioned amendments to the drawings are set forth in the two replacement sheets of drawings immediately following these Remarks.

3-4. Claim 10 stands rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. The Examiner states that the "specification does not enable for the sprocket end of the drive shaft to be supported by the oil pump housing."

In response, Applicants have amended claim 10 by deleting "oil pump housing" and inserting "sprocket side" to read "the sprocket side includes a third bore for supporting the sprocket end of the drive shaft." This is consistent with the rest of the specification. Applicants also respectfully point out that claim 11 claims an oil pump housing (58) including a fourth bore (60) for supporting a pump end (16) of the drive shaft (12).

Therefore, Applicants respectfully request that the rejection of claim 10 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement be withdrawn.

5-6. Claim 2 stands rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In response, Applicants have cancelled claim 2. Therefore, Applicants respectfully request that the rejection of claim 2 is no longer applicable.

7-8. Claims 1-3, 6-11, 13 and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by United States Patent 2,914,137 to Sykes ("the '137 reference"). Applicants respectfully traverse the rejection.

The '137 reference discloses a drive shaft 25 rotatably supported in a crankshaft balancer housing structure 16. A driven gear or sprocket 27 is fixedly secured to an input end of the drive shaft 25 for driving the drive shaft 25. An oil pump 40 is mounted on a second end of the housing structure 16 opposite the sprocket 27 and is driven by the drive shaft 25. A counterweight member 29 is mounted to the drive shaft 25 and a second counterweight member 31 is mounted on a lay shaft 33. The counterweight members 29, 31 are provided respectively with meshed gears 34, 35, so that the counterweight members 29 and 31 will rotate in opposite directions.

Independent claim 1, and claims 2-3 depending therefrom, have been cancelled. Dependent claim 14 has also been cancelled.

Independent claim 13, as amended, claims "a balance shaft extending axially from the driven gear for rotation with the driven gear in response to rotation of the drive shaft for dampening vibrations associated with the operation of the automobile engine, the balance shaft comprising at least two axially spaced offset masses."

The '137 reference does not disclose a balance shaft comprising at least two axially spaced offset masses. In the '137 reference, the drive shaft 25 includes one counterweight 29 mounted thereto and the lay shaft 33 includes one counterweight 31 mounted thereto. Thus, the counterweights 29, 31 are mounted on different shafts and rotate in opposite directions.

As a result, the '137 reference clearly does not disclose a balance shaft extending axially from a driven gear for rotation with the driven gear in response to rotation of a drive shaft for dampening vibrations associated with the operation of an automobile engine, **the balance shaft comprising at least two axially spaced offset masses**, as required by claim 13 of the above-captioned application.

Claims 6-11 have been amended to depend from claim 13 and, as such, are construed to incorporate by reference all of the limitations of claim 13, *see* 35 U.S.C. § 112, fourth paragraph.

Therefore, Applicants respectfully request that the rejection of independent claim 13, and claims 6-11 depending therefrom, under 35 U.S.C. § 102(b) as being anticipated by the '137 reference be withdrawn.

9-10. Claims 4 and 5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the '137 reference in view of United States Patent Application Publication 2001/0023623 to Killion ("the '623 reference"). Applicants respectfully traverse the rejection.

The disclosure of the '137 reference is set forth above. The '623 reference discloses an engine 52 including a balance shaft 50, a crankshaft 58, and a camshaft 60. The camshaft 60 is operatively coupled to the crankshaft 58 such that the camshaft 60 rotates in response to rotation

of the crankshaft 58. The balance shaft 50 includes a drive gear or sprocket 72 attached to it and the camshaft 60 includes a drive gear 84 attached to it. The meshing of gears 72 and 84 causes the balance shaft 50 to rotate in a direction opposite to that of the crankshaft 58 and thus counterbalance the vibrations caused by the engine 52.

Claims 4 and 5 depend from amended claim 13 and, as such, are construed to incorporate by reference all of the limitations of claim 13, *see* 35 U.S.C. § 112, fourth paragraph. Thus, each of claims 4 and 5 includes an oil pump drive assembly including an oil pump, a drive shaft having a distal input end and an opposite pump end secured to the oil pump for actuating the oil pump in response to rotation of the drive shaft, a sprocket secured to the distal input end of the drive shaft, a gear assembly for transferring a force from the engine comprising a drive gear secured to the drive shaft between the pump and distal ends and a driven gear engaged with the drive gear for rotation of the driven gear in response to rotation of the drive shaft, and *a balance shaft extending axially from the driven gear for rotation with the driven gear in response to rotation of the drive shaft for dampening vibrations associated with the operation of the automobile engine, the balance shaft comprising at least two axially spaced offset masses*, the gear assembly positioned at the distal input end of the drive shaft and the oil pump positioned at the opposite pump end of the drive shaft for providing packaging space for the oil pump drive assembly.

The cited references do not provide any teaching, suggestion, or motivation for one skilled in the art at the time of invention to incorporate a single balance shaft into the arrangement disclosed in the '137 reference. In the '137 reference, the drive shaft 25 is rotatably supported within the crankshaft balancer housing structure 16, which is wholly contained and

disposed within the oil pan 14. A counterweight member 29, 31 is mounted on the respective drive shaft 25 and the lay shaft 33, and each counterweight member 29, 31 is provided with meshed gears 34, 35 so that the counterweight members 29, 31 will rotate in opposite directions. There is no teaching, suggestion, or motivation to insert a single balance shaft into the arrangement of the crankshaft balancer housing structure 16 in the '137 reference.

The specific packaging considerations associated with the '137 reference provide further support for the contention that the claimed subject matter is not obvious in view of the cited references. The '137 reference states that "[a]nother object of my invention is to provide for a compact engine construction by removably mounting a crankshaft balancer housing in a readily accessible position in the engine oil pan." (Col. 1, lines 31-34). The '137 reference also states that "[a] still further object of my invention is to construct a readily modified engine by providing a unitary crankshaft balancer housing removably mounted on the lower face of the crankcase and disposed entirely within the engine oil pan." (Col. 1, lines 41-45). And, as mentioned above, the '137 reference states that "[a] crankshaft balancer housing structure 16... is wholly contained and disposed within the oil pan 14." (Col. 2, lines 7-11). In light of these packaging considerations, the cited references do not provide one skilled in the art with any suggestion or motivation to incorporate a balance shaft into a crankshaft balancer housing structure 16 that is disposed entirely within an oil pan 14, which is the specific arrangement set forth in the '137 reference.

Therefore, Applicants respectfully request that the rejection of claims 4 and 5 under 35 U.S.C. § 103(a) as being unpatentable over the '137 reference in view of the '623 reference be withdrawn.

11. Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the '137 reference in view of United States Patent 6,183,230 to Beardmore et al. ("the '230 reference"). Applicants respectfully traverse the rejection.

The disclosure of the '137 reference is set forth above. The '230 reference discloses an engine oil pump drive assembly 10 for driving an oil pump 14 and including a coarse splined hub 16 mounted to a source of rotational input, such as an engine crankshaft 12. The oil pump 14 includes a pump body 22 housing a gerotor pump set 28 which includes a pump rotor 30 and a pumping annulus 40.

Claim 12 depends from claim 13 and, as such, is construed to incorporate by reference all of the limitations of the claim to which it refers, *see* 35 U.S.C. § 112, fourth paragraph. Claim 13, as amended, claims a balance shaft extending axially from a driven gear for rotation with the driven gear in response to rotation of a drive shaft for dampening vibrations associated with the operation of an automobile engine, *the balance shaft comprising at least two axially spaced offset masses*. Therefore, claim 12 must be read as including the limitation of a balance shaft extending axially from a driven gear for rotation with the driven gear in response to rotation of a drive shaft for dampening vibrations associated with the operation of an automobile engine, *the balance shaft comprising at least two axially spaced offset masses*.

Neither the '137 reference nor the '230 reference discloses a balance shaft extending axially from a driven gear for rotation with the driven gear in response to rotation of a drive shaft for dampening vibrations associated with the operation of an automobile engine, *the balance shaft comprising at least two axially spaced offset masses*. As a result, the claimed subject

matter in claim 12 of the above-captioned application would not have been obvious to one skilled in the art at the time of invention in light of the '137 and '230 references.

Therefore, Applicants respectfully request that the rejection of claim 12 under 35 U.S.C. § 103(a) as being unpatentable over the '137 reference in view of the '230 reference be withdrawn.

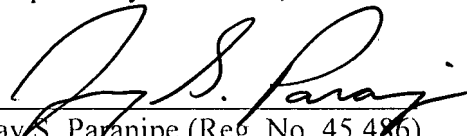
New claims 15-18 have been added. New independent claim 15 claims an oil pump drive assembly including a housing having a sprocket side and a pump side, the sprocket side including a first bore and a third bore and the pump side including a second bore and a fourth bore, an oil pump, a drive shaft disposed in the housing and extending axially between a distal input end supported in the third bore on the sprocket side of the housing and an opposite pump end supported in the fourth bore on the pump side of the housing, the opposite pump end secured to the oil pump for actuating the oil pump in response to rotation of the drive shaft, a sprocket secured to the distal input end of the drive shaft, a gear assembly for transferring a force from the engine comprising a drive gear secured to the drive shaft between the pump and the distal input end and a driven gear engaged with the drive gear for rotation of the driven gear in response to rotation of the drive shaft, and a balance shaft disposed in the housing and extending axially between a gear end supported in the first bore on the sprocket side of the housing and an opposite distal end supported in the second bore on the pump side of the housing, the gear end secured to the driven gear for rotation with the driven gear in response to rotation of the drive shaft for dampening vibrations associated with the operation of the automobile engine, the gear assembly positioned at the distal input end of the drive shaft and the oil pump positioned at the opposite pump end of the drive shaft for providing packaging space for the oil pump drive assembly.

Applicants respectfully submit that new independent claim 15 is not disclosed in the cited references. In addition, Applicants respectfully submit that there is no teaching, suggestion, or motivation in the cited references for the disclosure set forth in new independent claim 15.

It is respectfully submitted that this patent application is in condition for allowance, which allowance is respectfully solicited. If the Examiner has any questions regarding this amendment or the patent application, the Examiner is invited to contact the undersigned.

The Commissioner is hereby authorized to charge any additional fee associated with this Communication to Deposit Account No. 50-1759. A duplicate of this form is attached.

Respectfully submitted,



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Date: 5/8/07
Attorney Docket No: 19345-096232